



Global Business Services

The Nationwide Health Information Network (NHIN) Architecture

Maryland Health Care Commission

Task Force to Study Electronic Health Records

Defining Success Through Shared Stakeholder Value

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Healthcare 2015: *We must find a path to transform healthcare*

Healthcare in the United States is in crisis.

- The current paths of healthcare will be unsustainable by 2015
- The United States spends:
 - 22 % more than second-ranked Luxembourg
 - 49 % more than third-ranked Switzerland on healthcare per capita
 - US is ranked 37th in overall health system performance² by the WHO

The Transformational Challenge

1. Healthcare must **expand the current focus** from episodic, acute care to:
 - Include the life-long prediction and prevention of illness
 - Include the management of chronic disease
 - Include payment for quality care, and better coordination of care management
2. **Consumer behaviors must be transformed** to assume personal responsibility for their health
 - Interest, education, expectation, and involvement
 - Management of your own longitudinal health care record (PHR)
3. **Societal expectations** must transform in tandem.
 - How much healthcare is a societal right?
4. **Government is acknowledging the crisis A transformation path**
 - Strong leadership and political willpower
 - Supporting governmental action that extends beyond “term” limits
 - Equitable policy and funding
 - Self-sustainability

An Answer to Connect Healthcare Stakeholders

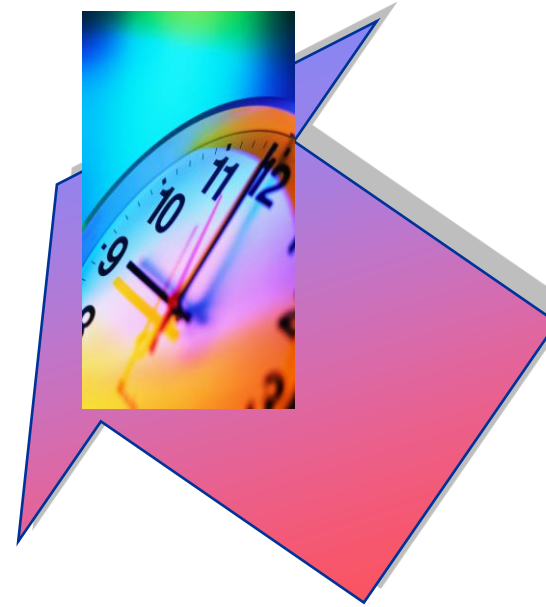
A shared architecture

The Nationwide Health Information Network



What is the NHIN?

- **1996:** Health Insurance Portability and Accountability Act raises our attention about health information sharing
- **January 2004:** President Bush's State of the Union Address calls for **electronic health records for all citizens**
- **July of 2004:** Federal Health and Human Services (HHS)/ Office of the National Coordinator for Health Information Technology (ONC) - **Framework for Strategic Action**
- **January of 2007:** Framework for Transformation -- NHIN Architecture Prototypes Completed
- **September of 2007:** NHIN Pilot Implementations at the State & Regional Levels



NHIN Architecture Prototype Project Overview

11/2005 to 1/2007

Demonstration Goal

- Develop and evaluate prototypes of an NHIN architecture that maximize use of existing resources to achieve interoperability among healthcare applications – particularly EHRs

Key Criteria

- **Design and demonstrate a standards-based network** prototype over the one year project period (Prototype versus Functional Network)
- Demonstrate the solution within and between **3 marketplaces / communities**
- Demonstrate the solution via a demonstration of **three use cases**

Collaborative approach with Other Vendors, Contracts

- American Health Information Community (AHIC)
- Health Information Technology Standards Panel (established by ANSI)
- Certification Commission for Health Information Technology (CCHIT)
- Health Information Security and Privacy Collaboration (established by RTI and National Governor's Assoc)



IBM Healthcare Marketplace Partners

Each vendor must demonstrate information exchange within and between three distinct community healthcare markets

■ Mid-Hudson Valley, NY (THINC)

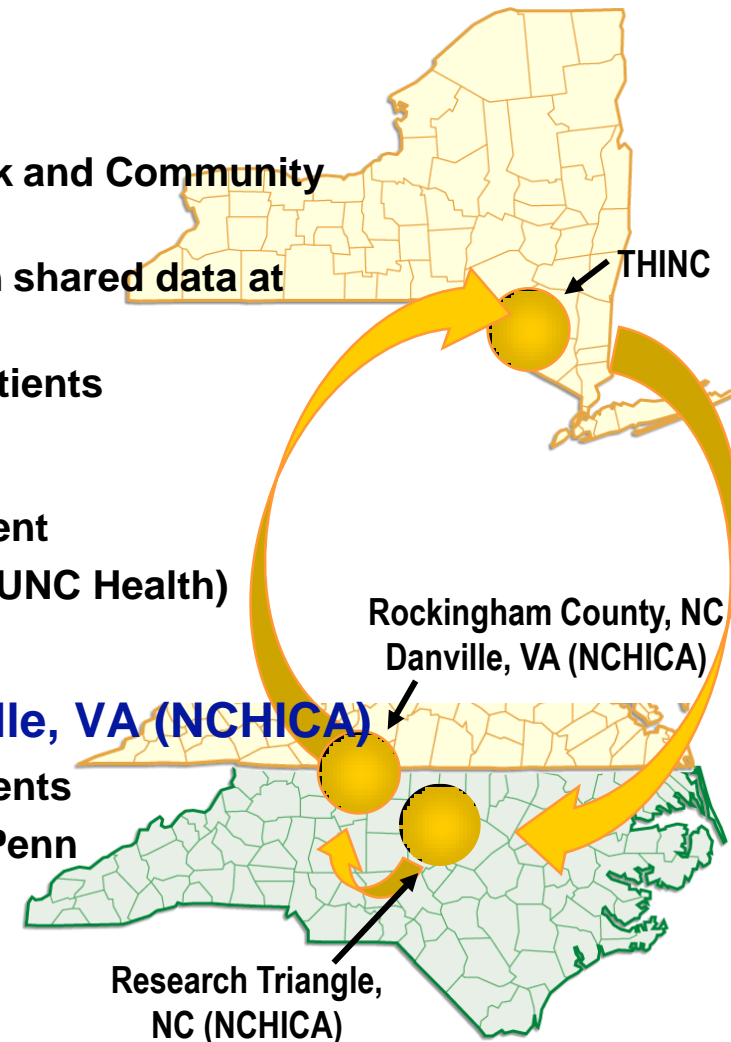
- Taconic Healthcare Information Network and Community (THINC)
- Mid-Hudson Valley: evolving RHIO with shared data at HealthVision hub
- 2,300 physicians supporting 700,000 patients

■ Research Triangle, NC (NCHICA)

- Competitive, high-tech urban environment
- Hospitals: Duke, WakeMed, UNC, Rex (UNC Health)
- Practices, Public Health, Pharmacies

■ Rockingham County, NC and Danville, VA (NCHICA)

- Rural environment with NC and VA patients
- Hospitals: Morehead Memorial, Annie Penn (Moses Cone Health System)
- Practices, Public Health, Pharmacies



Specific Use Cases for Phase 1 Prototype Demonstration

Electronic Health Record (Laboratory Results Reporting):

- Deploy standardized, widely available, secure solutions,
- for accessing laboratory results and interpretations,
- in a patient-centric manner,
- for clinical care by authorized parties.

Consumer Empowerment (Registration and Medication History) :

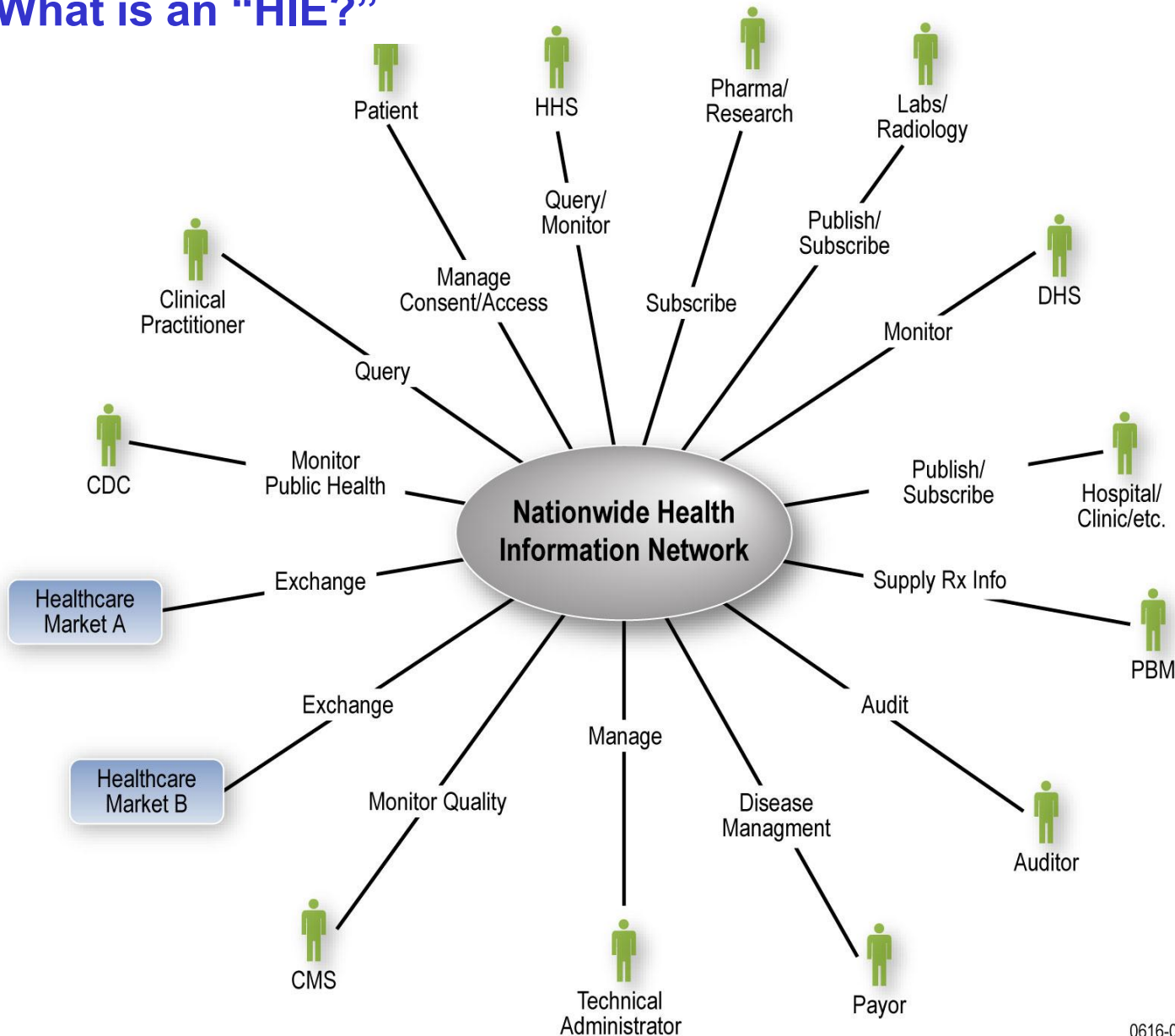
- Deploy to targeted populations a pre-populated, consumer-directed and secure electronic registration summary.
- Deploy a widely available pre-populated medication history linked to the registration summary.

Biosurveillance (Visit, Utilization and Lab Result Data):

- Transmit essential ambulatory care and ER visit, utilization, and lab result data
- from electronically enabled health care delivery and public health systems
- in standardized and anonymized format
- to authorized public health agencies with less than one day lag time.



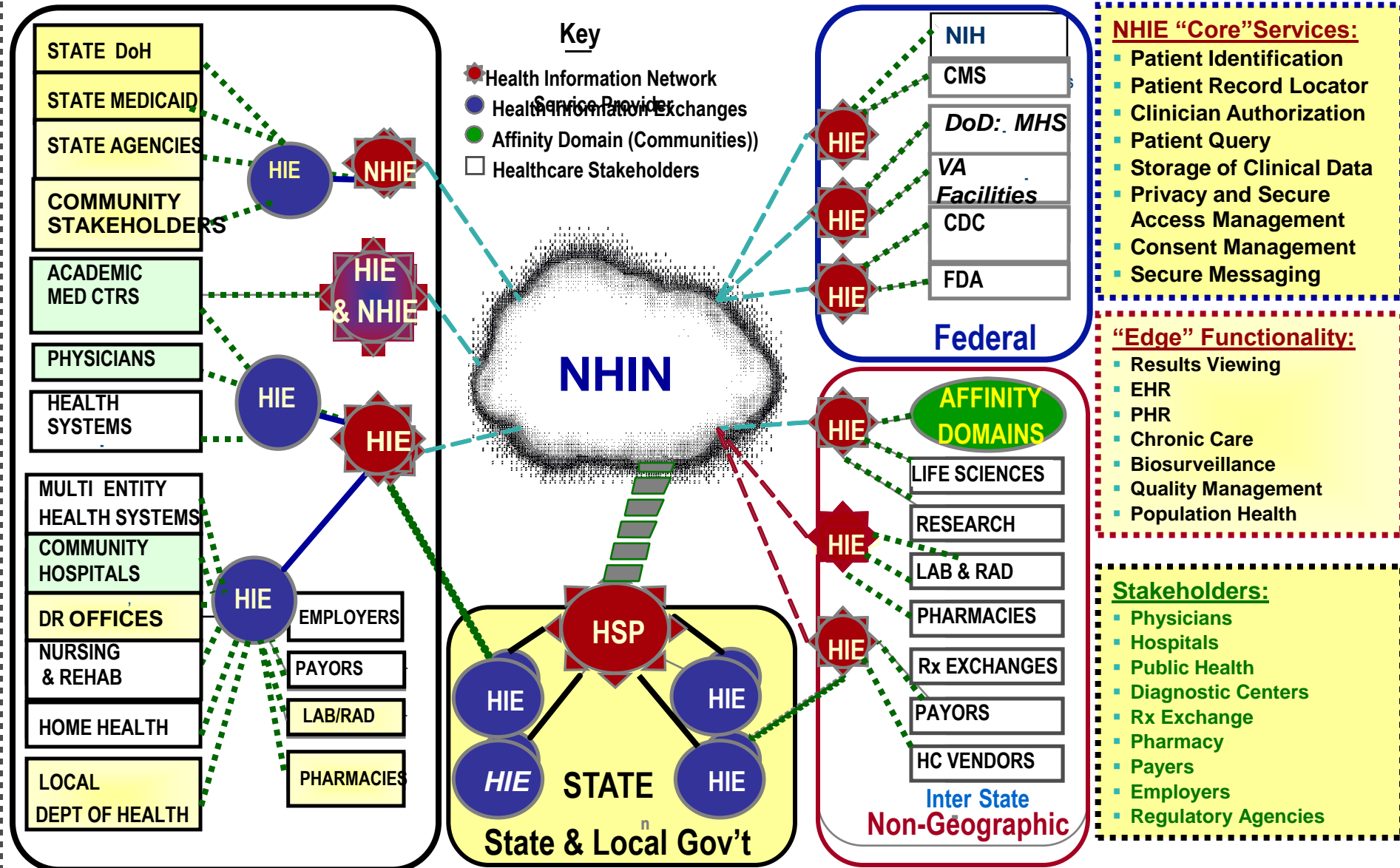
What is an “HIE?”



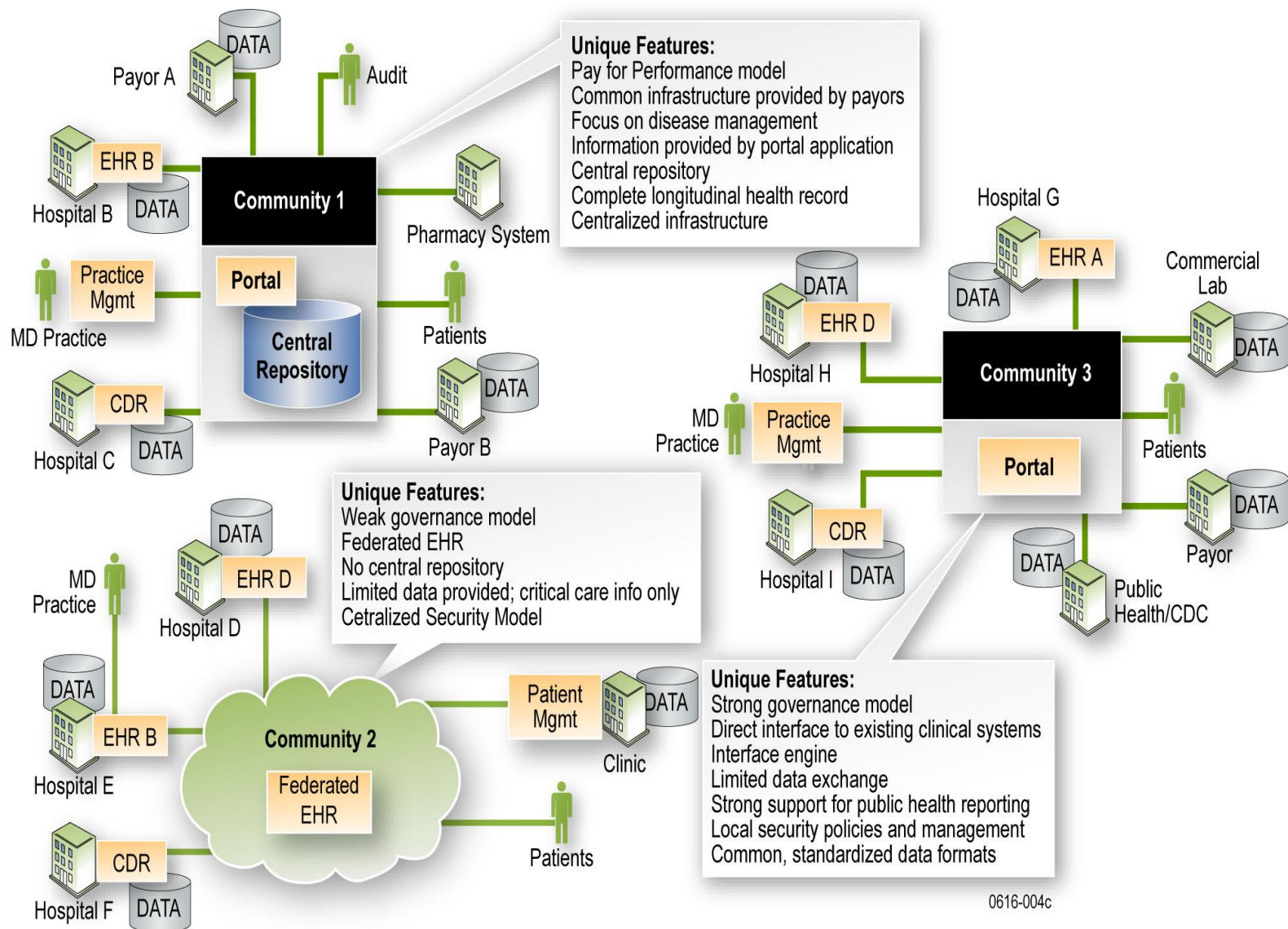
- Formal & tightly coupled (THINC)
- Informal & loosely affiliated (NCHICA)
- Large health system
- Coalition of smaller institutions
- Healthcare stakeholders
 - Reference Labs
 - Public Health
 - Research
- Payer driven or payer participatory
- Employer driven (Leapfrog)
- **HOW WILL HIE'S PLAY IN A NATION WIDE NETWORK?**

0616-043a

The HIE becomes a “broker” for the community



Interconnecting Health Information Exchanges with Differing Architectures



0616-004c

Guiding Principles for IBM's HSP Hosted Services Solution

■ Community-Centric

- Normalize and store clinical data within a community (doc repositories)
- Can be hosted by individual hospitals/practices and/or shared within the community
- Community hub provides MPI, document locator, security and support services
- The community hub is the gateway to other communities

■ Drive and conform to standards

- Instantiation of IHE interoperability framework
- Clinical events stored as HL7 CDA(r2)-compliant documents
- Cross-community search & retrieval

■ Provide security & privacy w/o sacrificing usability or research value

- Anonymous/pseudonymous data that can be re-identified as needed/permitted
- Supports other data aggregates (registries, biosurveillance, outcomes analysis, quality of care)

■ Practical

- Scalable and cost-effective at every level of practice
- Point-of-care performance is critical to adoption – Rock Solid!
- Flat monthly rates, incremental growth



Consumer Empowerment (PHR) Demonstrated Functionality

Patient: Patricia Walker, Age 89, Diabetic, Lives in NY and Poughkeepsie, NY (Dutchess County)

Family Caregiver: Mary Walker (Daughter), Greensboro, NC

Physician (s): Dr. Peter Norton, Primary Care Physician

THINC

Scene 1

PHR

Demonstrating:

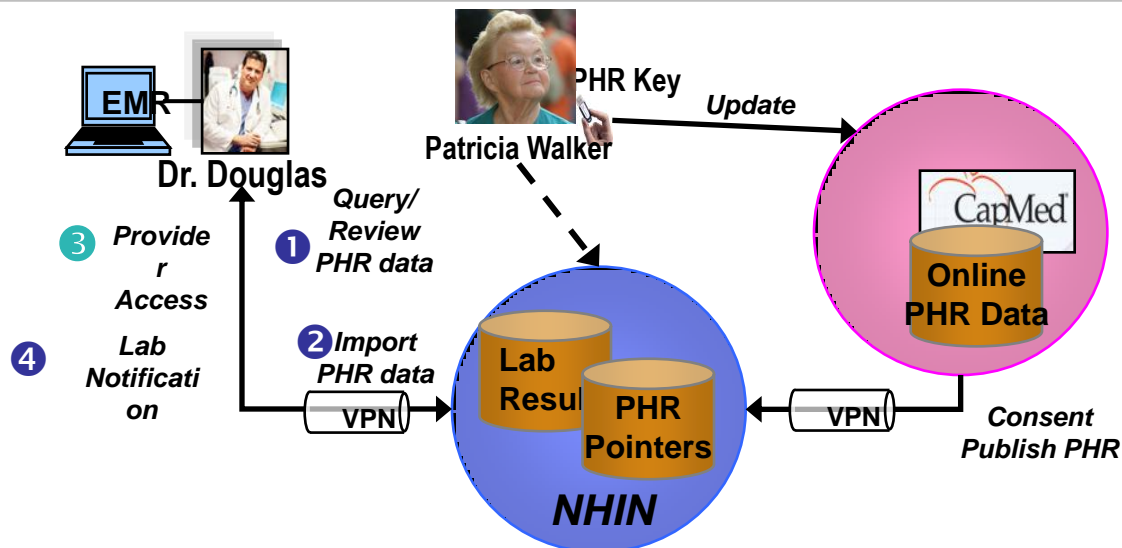
- Authenticate Patient for authorized access
- Review & edit registration/emergency data
- Upload biomedical device data
- Request & receive medication history from the NHIN
- Review & annotate medication data
- Establish PHR access permissions for physicians
- Upload medical summary from the NHIN (field level integration)
- Publish revise PHR data to the NHIN
- Demonstrate PHR portability (HealthKey, print, on-line sharing)

EHR/PHR – Integrating PHR Data into an EHR

Patient: Patricia Walker, recently relocated to Greensboro, NC
Family Caregiver: Mary Walker (Daughter), Greensboro, NC
Physician: Dr. Robert Douglas, Diabetic Specialist
Context: Patricia is visiting the Moses Cone Diabetic Clinic for her semi-annual appointment

Demonstration:

- ① Query and review PHR data
- ② Import PHR data
- ③ Provider access
- ④ Lab Notification



EHR – Document Integration & Validation

Patient: Patricia Walker, visiting her granddaughter in Pinehurst, NC

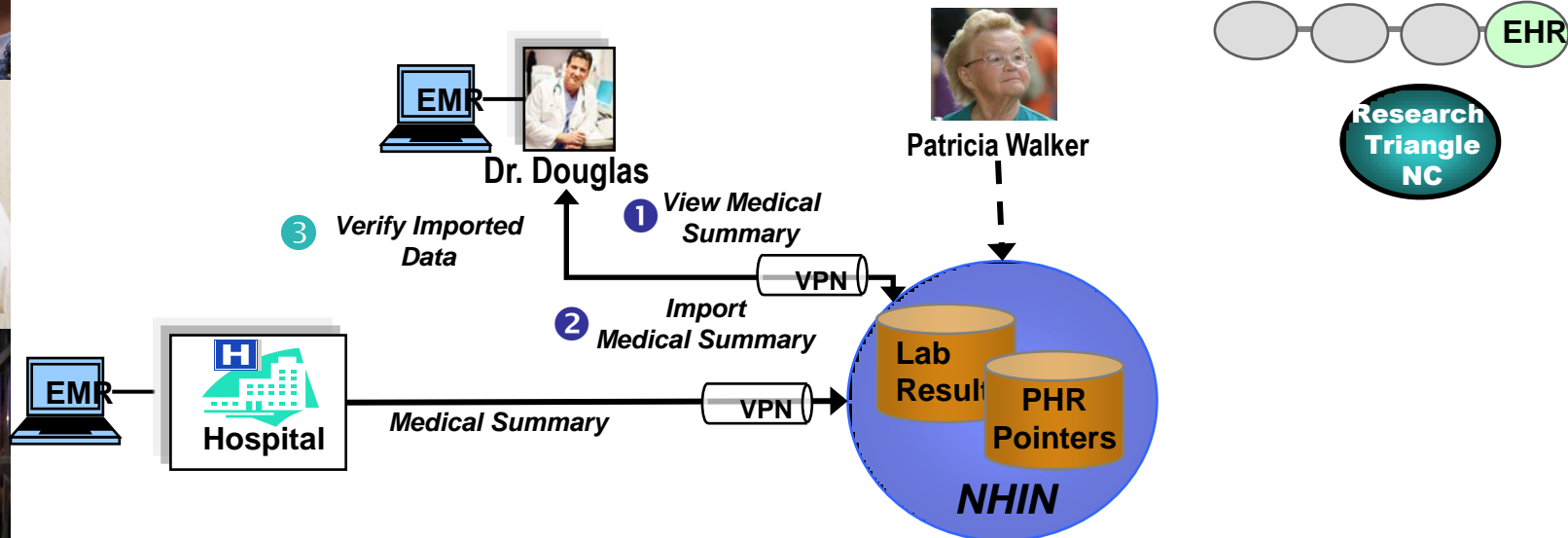
Family Caregiver: Mary Walker (Daughter), Greensboro, NC

Physician: Dr. Geoffrey White, Orthopedic Surgeon

Context: Patricia has an appointment with an orthopedic surgeon at Pinehurst Surgical Clinic because of increased knee pain

Demonstration:

- ① Viewing a medical summary document
- ② Importing a medical summary document
- ③ Verifying imported data



EHR Lab & Biosurveillance Reporting

Patient: Patricia Walker, visiting her granddaughter in Pinehurst, NC

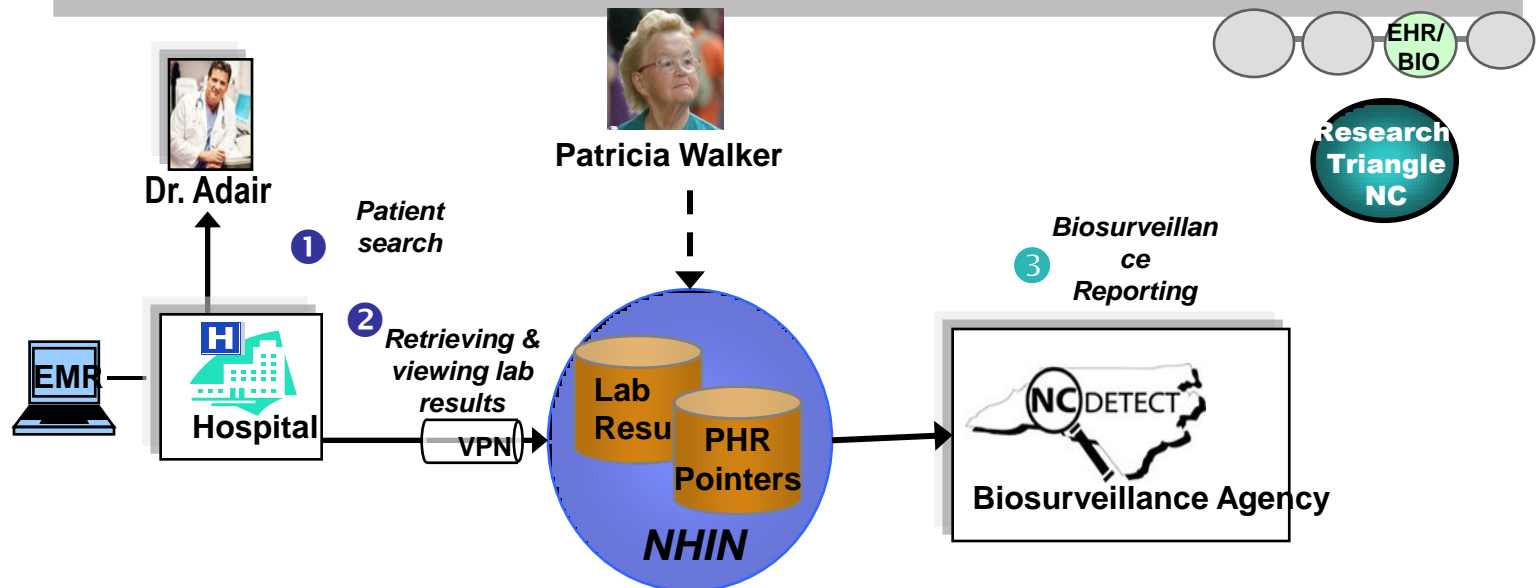
Family Caregiver: Mary Walker (Daughter), Greensboro, NC

Physician: Dr. Frank Adair, Emergency Medicine

Context: Patricia is taken to the Emergency Room with worsening flu-like symptoms

Demonstration:

- ① Patient search
- ② Retrieving and viewing lab results
- ③ Biosurveillance reporting to Dept of Health





Evolution of IBM's *Nationwide Health Information Network Architecture*

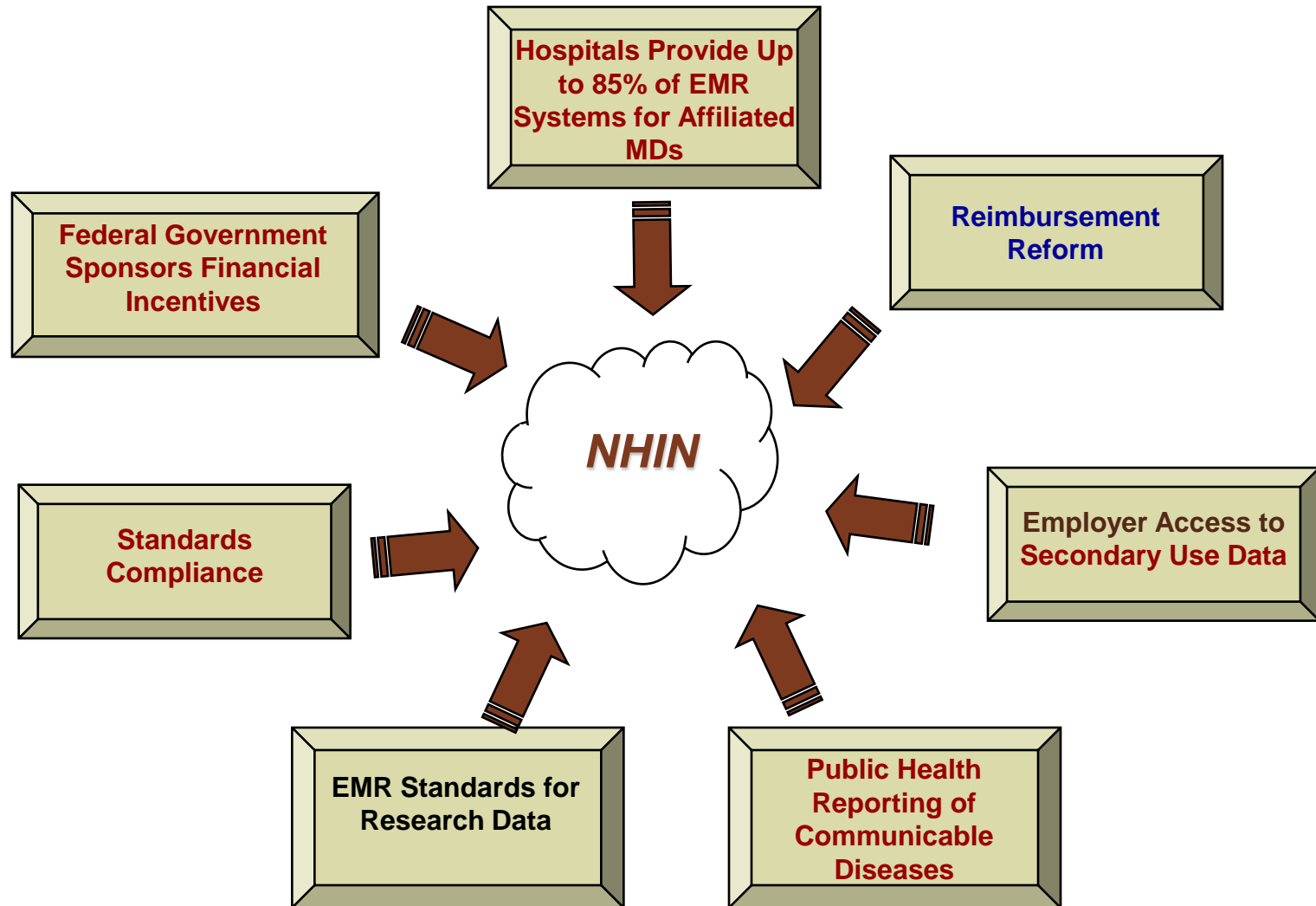
NHIN Phase 1 to NHIN Phase 2

2015: Will we get there in time?

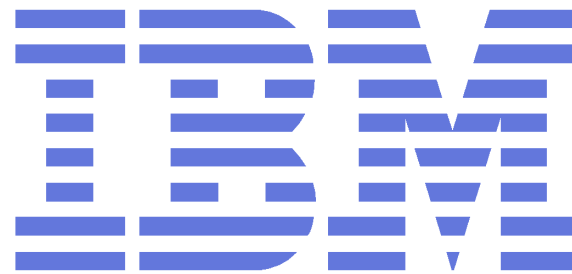
- **A driver is a factor that stimulates change:**
 - the use of technology to achieve productivity gains (NHIN, EHRs, PHRs)
 - Aging and overweight populations
 - Chronic illness consuming 75% of the HC resources
 - Growing awareness of adverse events (770,000 injuries/yr)
 - Duplicative services: estimates of 1 in 4 repeated (Productivity loss)
 - Fewer younger workers available to fund the needs
 - New medical technologies require research: 17 year cycle bench to bedside
 - Regenerative medicine: renewable parts through stem cells
 - Information based medicine
 - Borderless industries, and the need for PHI at the point of need and POC
 - Self-insured employers: assertive, promote and defend their interests and their employees
- **An inhibitor is a force that supports the status quo and prevents change**
 - Financial Constraints: the pool is not limitless
 - Lack of aligned incentives among stakeholders: payers, providers, patients
 - Security and Privacy concerns
 - Proliferation of Information (Overload)
 - Societal norms: Patients, Providers, Payors, Taxpayers



Levers That May Change The Market Context



The RHIO market is a dynamic market - public and private levers may accelerate adoption



THANK YOU!